

Leisler's bat (*Nyctalus leisleri*) in the west of Ukraine

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TYSHCHENKO V. Leisler's bat (*Nyctalus leisleri*) in the west of Ukraine. — The distribution of a rare in Ukraine species — *Nyctalus leisleri* in the west of Ukraine is considered. Until 1999, according to the literature, only four locations of this species were known. The first findings of this species in Podillia from Medobory Nature Reserve (Ternopil Region) are described. Colonies of *Nyctalus leisleri* were found in two locations in Gorodnytsia forestry of the reserve in August 1999. One colony (numbering approx. 40 ind.) were found in a crack hollow of ash (2 females, 2 males were caught). A second colony (probably mixed with *Nyctalus noctula*) was observed in the hollow of a sharp-leaved maple (7 females and 4 males were caught). Swarming of *Nyctalus leisleri* near this shelter was observed and *Myotis bechsteinii* was also caught here. The features of the hollows location and the characteristics of biotopes are described. The specifics of biotopes with *Nyctalus leisleri* roosts in the region is assessed. The importance of preserving hollow trees in areas with variable landscape for this species protection is noted.

Leisler's bat (*Nyctalus leisleri* Kuhl, 1817) (NYL) is a rare species of the local fauna included into the Red Data Book of Ukraine (1994, VU). This species has a sporadic distribution in the territory of Ukraine and is known in the majority of its regions only by several separated summer findings. There is a lack of information on wintering sites of NYL in the territory of Ukraine, but some of early spring and late autumn findings in the south of Ukraine (Berestennikov, 1977; Dulitsky, 1979) may indicate probable wintering there. NYL presence at many regions was not confirmed by findings during the last decades, and the total number of NYL populations has a tendency to decrease (Kryzhanovsky 1988; Krochko 1992; Bulakhov & Chergorka 1998; Polushina 1998; Kovalyova 1999). Totally, 17 NYL individuals (8 males, 6 females, 3 unknown) from about 9 sites of Kharkiv, Kherson, Kyiv, Poltava, Luhansk, and Kirovograd regions are presented in the collections of three main zoological museums: National Museum of Natural History (Kyiv), Zoological Museum of Kyiv Taras Shevchenko University, and State Natural History Museum (Lviv). Another 6 individuals (1 male, 5 females) from Kherson and Dnipropetrovsk regions are thoroughly described by Mygulin (1938). About 35 places with NYL findings in Ukraine (mainly in central and eastern regions) are registered by scientists at different time (Mygulin 1938; Kuziakina 1950; Abelentsev & Popov 1956; Abelentsev 1967; Abelentsev *et al.* 1970; Dulitsky 1979; Likhotop & Sologor 1991). Some of these references are outdated and not confirmed by recent facts.

This species was not found in the Carpathian region until 1960th (Abelentsev & Popov 1956; Tatarinov 1956; Abelentsev 1967). The territories of western Ukraine, *i. e.* the Transcarpathian region, Ukrainian Carpathians, and Volyno-Podillia constitute the “hotspot” of the highest rank, where the share of endangered mammal species is superior (Zagorodniuk 1997). Moreover, this “hotspot” is one of the areas of endemism in Ukraine. There is a tendency of increase in number of species from the east to the west due to wider diversity of habitats, extension of the number of shelters, as well as climatic factors (Krochko 1994).

Only four places of *Nyctalus leisleri* findings in western regions of Ukraine were known until 1999 (see Fig. 1):

1. Nearby Penyaky village, Pidkamin district, Lviv region. Three NYL individuals, which were collected in the XIX century and were kept in the collections of Lviv State Natural History Museum (Natural History Museum of Institute of Agrobiobiology) (Tatarinov 1956)*.
2. Strusiv (Strusy) village, Terebovlyansky district, Ternopil region (Abelentsev & Popov 1956). The date and authors of this finding are not denoted.
3. Zolochiv town (vill.), Lviv region (Abelentsev & Popov 1956). The date and authors of this finding are not denoted.
4. Nearby Mala Uholka village, Tyachiv district, Zakarpatska oblast. One NYL individual (female; forearm length 44 mm) was captured 20.05.1965 by Abelentsev (1967). Capture was carried out by mist net at the forest glade on the right bank of Mala Ugolka River in beech forests zone of southern Carpathian slopes. There were also registered *Myotis myotis*, *Barbastella barbastellus* and *Eptesicus serotinus* at the same forest glade. According to other data (Zagorodniuk *et al.* 1997), 3 NYL individuals have been captured since 1963 at this territory (Carpathian Biosphere Reserve Uholsky massif).

For a long time, NYL distribution in Podillia was not confirmed by findings (Belke 1858; Brauner 1910; Kunts & Noskevich 1938; Tatarinov 1956, 1974; Polushina 1998), so this species’ existence in the region was dubious. Our 1998–2000 summer expeditions to Central and Western Podillia confirm the NYL presence here. Leisler’s bat was found for the first time in two districts in the territory of Gorodnytske forestry of Medobory Nature Reserve (Ternopil region) in August 1999 (see Fig. 1: point 5 and 6).

NYL ecological features are poorly studied, that is why our findings of Leisler’s bat in bisex colonies in the territory of Medobory Nature Reserve are of valuable importance for research of this rare species.

* It is possible that one of them (without original label data) is displayed in the exposition of the Lviv State Natural History Museum.

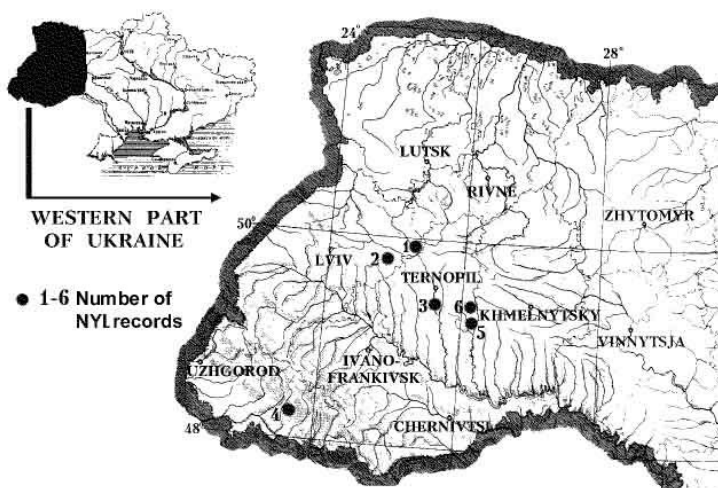


Fig. 1. Sites of *Nyctalus leisleri* findings in western Ukraine.

Рис. 1. Місця знахідок *Nyctalus leisleri* на заході України.

Medobory Nature Reserve (10454 ha) is situated to the east of Ternopil region. The territory of the reserve occupies the forested parts of Tovtry range, raising up to 100 m over the Zbruch river valley — the eastern border of reserve. Forest associations occupy over 90 % of the total area of the reserve. They are represented mainly by oak-hornbeam, hornbeam and hornbeam-ash forests on grey and dark-grey wood soils. The conditions of the reserve facilitate the formation of reach and specific entomofauna. A large number of rare insect species was registered (Kapelyukh 1999). The features of relief in the reserve, diversity of karst formations, and availability of old forest tracts altogether create favourable microclimate, good conditions for shelter and feeding of many bat species.

A search for bat roosts in forest tracts was conducted by route examination of districts with immature and mature forests in the evenings. The location and habitation of hollows were determined by registration of social vocalisation of bats. The number of bats in the roosts was evaluated visually as they flew out in the evening. Registration of species and sex determination were carried out by capture of bats with mist nets in the investigated area, and by external examination and measuring. Moreover, photographing of bats and collection of endoparasites were conducted.

Nyctalus leisleri colony (see point 5 on Fig. 1) was settled in *Fraxinus excelsior* crack hollow (age of the tree is about 70 years). This hollow was created as a result of longitudinal mechanical peeling of bark at the south-west inclination of the tree. Two little slit-like openings were placed on the height 1.9 m from the ground (see Table 1).

Leisler's bat individuals settled in the upper part of the hollow as far as 15–30 cm from the openings. NYL colony was formed by approximately 40 individuals. Four of them (2 m and 2 f) were captured during daytime on 13.08.1999 and measured (see Table 2). This locality is situated on the northeast exposition of a slope (5°-15°) 100 m beyond the quarter cutting and 1.25 km beyond the Zbruch river. There is a glade of 15 x 20 m formed by windfall. Forest stand is rarefied and is composed mainly by middle-aged *Fraxinus excelsior*, *Acer platanoides*, *Fagus sylvatica*, and *Quercus robur*.

The second *Nyctalus leisleri* locality (see point 6 on figure) was on the afforested limestone swelling 50x70 m, which is stretched out from southeast to northwest. Eleven NYL individuals (4 m; 7f) were caught in this area on 16.08.1999 (see Table 2). The definite roost placing was not determined.

Table 1. Specifics of *Nyctalus leisleri* roosts location in Medobory Nature Reserve

Таблиця 1. Особливості розташування сховищ вечірниць малої у «Медоборах»

№ of roost	Location of roost	Tree species	D, cm*	h, m**	Dimension (cm) and orientation of hollow opening	Orientation of hillside	Dimension of glade, m***
1.	Gorodnytske forest range, 27 quartal	<i>Fraxinus excelsior</i>	43	1,9	Slit-like hollows: 14 x 1,2 SE 5 x 0,8 NW	NE 5–15°	15 x 20
2.	Gorodnytske forest range, 24 quartal	<i>Acer platanoides</i>	59	7,0 7,5 9,0	5 x 6 S SW S	Height	10 x 15

* Diameter of tree at a height of 130 cm; ** height of hollow opening; *** dimension of glade before hollow tree.

Table 2. Some parameters of *Nyctalus leisleri* captured in Medobory Nature Reserve

Таблиця 2. Деякі показники відлову вечірниць малих у заповіднику “Медобори”

No. of roost	Date of capture	Local time of capture	Sex	Forearm length, mm
1	13.08.1999	–	m	42,3
		–	f	44,1
		–	f	46,0
		–	m	42,0
2	16.08.1999	00.55	f	45,3
		01.04	f	43,0
		03.45	f	44,4
		04.15	f	43,9
		04.25	f	44,7
		05.21	f	43,7
		05.32	M	43,1
		05.39	M	43,9
		05.39	M	43,7
		05.41	M	–
		05.47	F	43,9

However, we can suppose that the colony of NYL was situated in the upper hollow of *Acer platanoides* (at the height of 9 m) (see Table 1). Emergence of *Nyctalus noctula* was recorded from the lower opening of this tree (at the height of 7 m). The presence of the upper roost in this tree was confirmed by long-term swarming of Leisler's bats near this shelter from 00:40 am until 01:10 a.m., and from 04:10 until 05:50 a.m. (local time) at the height of 2–3 m. It is necessary to note that this swarming was not disturbed by light, smoke of campfire, and passing drizzle. Presence of the same mite *Spinturnix accuminatus* (the mites gathered from the bats were identified by Bobkova) on both bat species (*Nyctalus leisleri* and *Nyctalus noctula*) is one more argument that the mentioned roosts were next to one another or it was a mixed double-species colony. Similar allocation of the roosts of these species was described by Kuziakin (1950). A little glade (10 x 15 m) was near this tree. Steep slope and deep ravine bordered this area on the south, and thickened stand of the underwood — on the north. Here and there, this area was covered by lump limestone outcrops. Rarefied forest stand was composed mainly by mature *Acer platanoides*, *Fraxinus excelsior*, *Tilia cordata* trees and immature *Carpinus betulus*, *Acer campestre*, *Ulmus caprinifolia* trees. High density of insects from Diptera and Hymenoptera orders was marked here. *Nyctalus noctula* (4 m, 2 f) and *Myotis bechsteinii* (1 m) were also captured for examination in this area.

Conditions of Medobory Reserve are favourable for Leisler's bat existence. Absolute absence of human interference and realisation of monitoring investigations are important factors for conservation of this rare species.

The analysis of NYL findings in western regions and generally in Ukraine demonstrates that NYL habitats are adapted to the broad-leaved forest and forest park massives of the Forest-steppe zone, and to the river-valley forests of the Steppe zone. These are mainly sparse mature and immature oak, hornbeam-oak, oak-pine, beech forests, and floodplain forests. Evidently, allocation of such forest massives on slopes or swellings is favourable for NYL. This creates good conditions for heating of treecrowns, reproduction of entomofauna, and simplifying bat maneuvering during taking-off and returning to the treehollow. Little information is known on features of NYL roosts in the territory of Ukraine. More often summer NYL roosts are allocated in treehollows (on *Quercus robur*, *Tilia cordata*, *Acer platanoides*, *Pyrus communis*, *Populus nigra*, *Fraxinus excelsior* species), or in bird boxes (Abelentsev & Popov 1956; Likhotoj & Sologor 1991; Krochko 1997). Crack hollows in bark peeling and typical hollows with upper cavity also may be used as NYL roosts. Most probably, the height of hollows allocation is not of great importance. Hollows with two entrances, which have oval or chinky shape, are the most favourable for NYL habitats, as it follows from personal investigations, and confirmed by Kuziakin (1950) and Abelentsev & Popov (1956). Social sounds of NYL colony can be heard in the evening from the roosts on a distance of 30–40 m. This species is sensitive to disturbance in the roost. During visual examination, NYL individuals are not as aggressive as *Nyctalus noctula*.

This species is not registered in Volyn, Rivne, Chernigiv, and Sumy regions of Ukraine. The absence of NYL findings in Ivano-Frankivsk, Chernivtsi, Khmelnytsky and Zaporizhzhya regions can be explained by the lack of bat investigations in these regions. We suppose that the effective measures for conservation of this interesting species include execution of directives by forestry managers, according to which they have to preserve hollow trees in forest massifs with ecological purposes, and to keep the “quiet season” (May, June, and July). Organization of local reserved areas with NYL roosts, and upgrading of NYL conservation status in the next edition of the Red Data Book of Ukraine would contribute to conservation of this important species.

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Резюме

ТИЩЕНКО В. Вечірниця мала (*Nyctalus leisleri*) на заході України. — Розглянуто поширення рідкісного в Україні виду — вечірниці малої (*Nyctalus leisleri*) на заході України. До 1999 року за літературними даними відомо лише чотири місцезнаходження виду. Описано перші на Поділлі знахідки виду в природному заповіднику «Медобори» (Тернопільська обл.). Колонії вічирниць *Nyctalus leislerii* знайдено у двох місцезнаходженнях на території Городницького лісництва заповідника у серпні 1999 року. Одну колонію чисельністю близько 40 особин знайдено у щільному дуплі ясена (відловлено 2 самиці і 2 самці). Другу колонію (ймовірно спільну з *Nyctalus noctula*) відмічено у дуплі клена гостролистого (відловлено 7 самиць і 4 самці). На ділянці спостерігалось роїння вечірниць, тут відловлено також нічницю довговуху (*Myotis bechsteinii*). Описано особливості розташування дупел та характеристики біотопів. Оцінено біотопічну приуроченість ховищ виду у регіоні. Відмічено важливість збереження дуплистих дерев на ділянках зі змінним ландшафтом для охорони виду.